

## FUEL TANK

Choose the proper fuel tank as recommended by the manufacturer of your airplane kit. Thunder Tiger has a series of new tanks that are available at your hobby dealer.

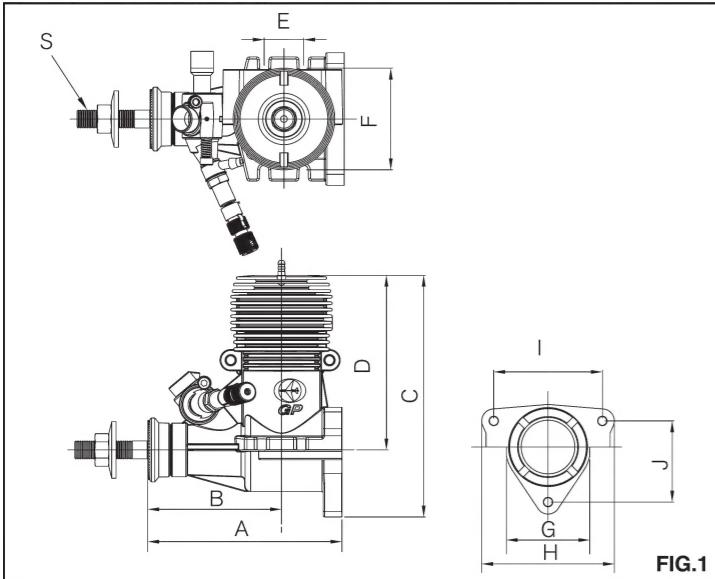
## FUEL LINE

Choose a high quality, silicone fuel line for use with your Thunder Tiger engine.

## INSTALLATION OF THE ENGINE

Mount your engine securely to rigid hardwood rails (e.g. maple) or a radial engine mount of metal or glass-filled nylon composition. The top surfaces of the motor mount must be absolutely flat and parallel to avoid crankcase distortion and stress. Be sure to use only the highest quality mounting hardware such as hardened steel screws, etc. In order to reduce engine noise, a flexible engine mount can also be used.

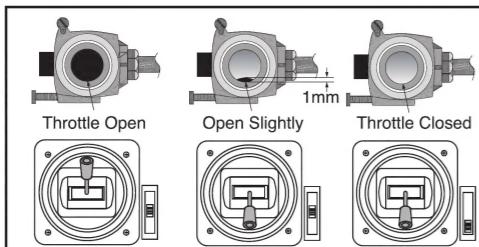
There is another convenient way to mount your new GP engine to fire wall of your airplane by using engine backplate. The major dimensions of this engine are shown as FIG.1.



	A	B	C	D	E	F	G	H	I	J	S (Thread)
GP-07 9007	47.1/ 1.85	31.8/ 1.25	56.3/ 2.22	39.9/ 1.57	10.0/ 0.39	25.0/ 0.98	19.4/ 0.76	30.4/ 1.20	24.0/ 0.94	19.5/ 0.77	M4x0.7
GP-18 9018	60.8/ 2.39	43.3/ 1.70	76.3/ 3.00	54.5/ 2.15	14.4/ 0.57	33.0/ 1.30	25.4/ 1.00	42.5/ 1.67	34.0/ 1.34	26.6/ 1.05	7/32"-32 UNF
GP-28 9028	68.8/ 2.71	47.4/ 1.87	85.7/ 3.37	61.9/ 2.44	14/ 0.55	36.0/ 1.42	29.6/ 1.17	47/ 1.85	38.5/ 1.52	28.7/ 1.13	1/4"-28 UNF

## RADIO SET-UP

Set up your throttle servo linkage to the carburetor throttle arm so it provides the action indicated when the transmitter throttle stick is moved.



## FUEL TANK

The fuel tank should be mounted as close to the engine as possible. Ideally, the center line of fuel tank should be level with the needle valve. The design of your aircraft will determine the actual tank location, but use the above instruction as a guide. Keep in mind that tank location can have a major impact on engine performance. Make sure that your engine fuel system is sealed and well constructed to eliminate the possibility of fuel or air leakage. If possible, wrap your fuel tank with high quality foam rubber to reduce fuel foaming from airframe vibration.

## GLOW PLUG

Use a 4-way wrench to insert the glow plug into your engine. Be careful not to use excessive force, but make sure the plug is tight and the copper washer is properly sealed beneath the glow plug.

## MUFFLER/SILENCER

After the engine is mounted in your model or test stand, secure the muffler to the exhaust pipe. Be sure to tighten them firmly. The rear half of the muffler can be rotated to direct the exhaust residue away.

## FUEL AND PRESSURE LINES

After installing the engine, use knife or razor blade to cut the silicon tube to proper length for use as fuel and pressure lines. As illustrated, connect the fuel tank to the carburetor and the fuel tank to the pressure fitting on your muffler. Do not use any tool to cut the silicon tube that may cause it to split or crack.

## PROPELLER

Mounted the suitable propeller securely to your engine. Screw the propeller slowly to the crankshaft of your engine in a counter-clockwise direction until compression is first felt near the position the piston is close to Top Dead Center (TDC). Turn the propeller so that the blades are set at the 2 and 8 clock positions and use the proper wrench to tighten the propeller nut. If using a spinner, make sure that the cut-out area for the propeller blades offer adequate clearance so that no part of the prop is touching the spinner.

### CAUTION:

It's extremely important to check the balance of your propeller before attaching it onto your engine. An unbalance propeller can cause substantial damage to both the aircraft and the engine. You can use a propeller balancer (Thunder Tiger No. 3163 Aluminum Propeller Balancer) to balance your propeller before using.

## BREAK-IN /RUN-IN PROCEDURES

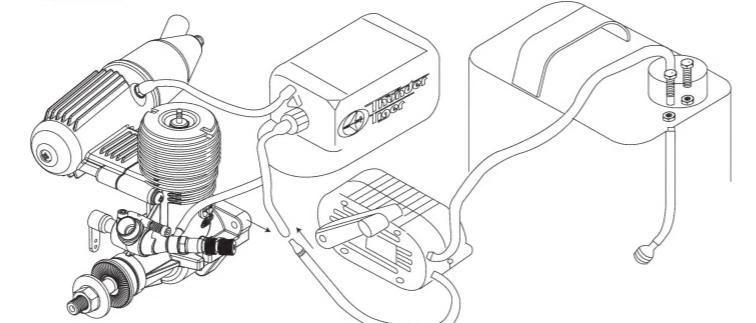
Proper break-in is critical to the life of any model engine. Because your Thunder Tiger GP series engine has been precision-made from quality material and is an ABN (Aluminum Piston, Brass Cylinder with Nickel Coating) type engine, a prolonged break-in period is not necessary. In fact, after a tank or so on the ground, your engine can be flown to break it in. The break-in period can take place on your model or on a test stand. Many companies offer good quality, low cost engine test stands should you choose to bench-run your engine prior to installation in the aircraft. Never use a vise to hold an engine for break-in as this can distort the crankcase and ruin your engine. No matter where the break-in is done, you can break-in your engine as follows:

### 1) Fuel, Glow Plug & Propeller Selection & Installation

Use the proper fuel, glow plug and propeller as described in NECESSARY ACCESSORIES. And make sure that the glow plug and propeller are installed and properly tightened.

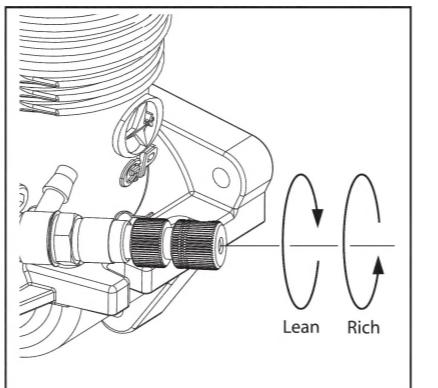
### 2) Filling the fuel Tank

Disconnect the pressure line from the pressure fitting on the muffler and fuel line from the fuel inlet on the carburetor. Connect the fuel line to the tubing from fuel pump to fill the fuel tank until fuel overflow into the pressure line indicating the tank is filled. Re-connect fuel line to fuel inlet and pressure line to pressure fitting. Be sure to not let dirt or dust enter fuel container.



### 3) Pre-Adjust Needle Valve

During the break-in period, run the engine under "rich" condition. Turn the needle valve clockwise until you begin to feel resistance. This is the fully closed position. Do not force the needle valve or you may damage the carburetor! Now turn the needle valve counter-clockwise about 2 1/2 ~ 3 turn open. This will be a good place for start. (Turn the needle valve clockwise to "close" for leaner mixture, while counter-clockwise is to "open" for richer mixture.)



## 4) Choking/Priming Your Engine

Using your radio control system, move the throttle stick to open the throttle to 1/2~3/4. Place your finger over the carburetor opening (without the glow plug starter connected!) and rotate the propeller 2~3 turns or until fuel flows through the fuel line into the carburetor.

The quantity of fuel drawn into the engine by priming is an important factor for starting your engine successfully. It needs more fuel for the first starting and when the engine is cold. It will be quickly learned with experience.

### 5) Heating Glow Plug

Fit the glow starter or connect the 1.5volt ignition battery onto the glow plug. The glow plug is designed to keep the engine running after removing the glow starter or cutting off the ignition battery. The platinum alloy coil inside the glow plug is heated up with the starter battery current, and remains hot to keep the engine running even after the electronic power is cut off.

### 6) Flipping propeller to start the engine

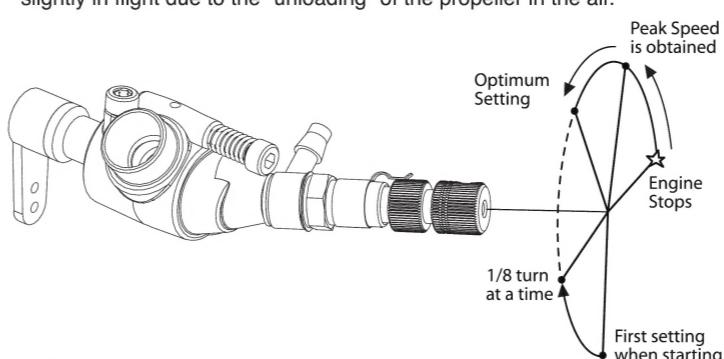
Using your radio control system, move the throttle stick so the carburetor rotor is 1/4~ 1/2 open. Flip the propeller to start the engine by using a "chicken-stick" or electric starter. The engine should fire after a few flips. If you break-in the engine on the aircraft model, when the engine starts, have a helper hold your aircraft to prevent it from moving.

### CAUTION

- 1) Do not place anything in the path of the propeller.
- 2) Practice flipping the propeller quickly without connecting the battery. Quick flipping and adequate priming are important factors for starting your engine successfully.

## 7) NEEDLE VALVE ADJUSTMENT

After the engine starts, advance the throttle to full open. At this point, the engine should be running under "fuel rich" condition (i.e. dense smoke coming from the exhaust). Close/Lean(turn clockwise) the needle valve gradually until you hear a noticeable sound due to an increase in R.P.M.. Remove the glow-starter from the engine with care so that it does not touch the rotating propeller. The engine should keep running. If it stops, close/lean the needle valve a little further, and re-start the engine. Close the needle valve about 1/8 turn, and listen for the change of R.P.M.. After the R.P.M. increase, close the needle valve 1/8 turn at a time listening for a change of R.P.M.. If the R.P.M. of the engine does not instantly change with needle valve adjustment, slowly lean the needle setting until the R.P.M. decreases. Back the needle valve off to where the peak R.P.M. position is. At that point, richen the needle setting slight until you hear a slight (but noticeable) decrease in R.P.M. You should never set your engine for peak R.P.M. on the ground, as the mixture always leans out slightly in flight due to the "unloading" of the propeller in the air.



### 8) STOP THE ENGINE

Cut off the fuel supply to the carburetor by pinching closed the fuel line or disconnect the fuel line. You may also stop the engine using your radio control system by going below the idel position with the throttle trim lever on your transmitter.

### CAUTION

Do not use your hands, fingers, any parts of your body, or throw any object into the propeller to stop the engine. Be careful not to touch the rotating propeller or the hot engine.

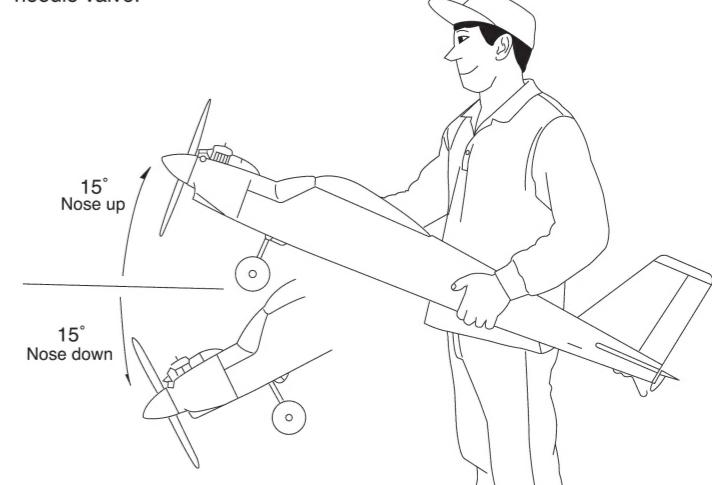
## CAUBURETOR ADJUSTMENT

The air-bleed carburetor with a throttle rotor and an air-bleed screw provides a wide range of engine speed control from idling to full power. The throttle rotor with the throttle lever linked to a servo under the control of the

R/C system in your model will enable engine speed to be varied. As the carburetor of your engine has been factory set for approximate best running with fuel tank correctly located as previous described, it should not be required to adjust anything except the needle valve. After the engine has been broken-in, check the operation of the throttle according to the following and re-adjust the air-bleed screw when necessary.

## NEEDLE VALVE ADJUSTMENT

In order to determine the best position of the needle valve, you should hold your aircraft and rotate the nose up approximately 15° slowly. If the engine speeds up and attempts to stop, rotate the aircraft nose down to the horizontal position and open (counter-clockwise) the needle valve 1/4~1/2 turn. Then repeat the nose up procedure again to get the best setting of the needle valve.



## AIR-BLEED SCREW ADJUSTMENT

- 1) Start the engine and open the throttle fully.
- 2) Adjust the needle valve to the best position.
- 3) Close the throttle gradually from the highest speed to idle.
- 4) Find and fix the idling position where the lowest possible R.P.M. with steady running is obtained by means of the throttle trim on your transmitter without risk of the engine stopping.
- 5) In order to determine which way to adjust the Air-bleed screw, first determine the present condition of the idle fuel mixture. Hold your aircraft and slowly rotate the nose up approximate 15°. If the engine runs unevenly or stops, immediately rotate the nose down approximate 15°. The engine should run steadily. Stop the engine and close (clockwise) the air-bleed screw about 1/2 turn. If the idling speeds up with the nose down, then stop the engine and open the air-bleed screw about 1/2 turn.

### Note:

These adjustments can be made without stopping the engine. However, it is adjustable for beginners to stop the engine for safety reasons.

## ENGINE CARE

Always keep the outside of your engine clean. Use clean, fresh fuel can keep your fuel can, pump, and fueling system free from dirt particles. Install a fresh filter between the fuel tank and carburetor, and between your fuel pump and filling line to prevent any dirt from entering your engine. Model fuel contains alcohol, which is hydroscopic (meaning that it attracts moisture from the atmosphere). This can cause corrosion to the internal engine parts. After each flying session, run all the fuel out from inside the engine by disconnecting the fuel line from the carburetor. If you will not be using your engine for a while, we suggest removing the engine from the model, liberally and applying 4 or 5 drops of after-run oil (Marvel Mystery Oil, Zap, etc.) into the carburetor and glow plug hole, and wrap your engine in a soft cloth and store in a sealed plastic bag. Do not dismantle your engine unnecessarily, as this may upset precision fits such as piston/cylinder and crank pin/connecting rod assembly. If it is necessary to clean your engine completely (such as after a crash), remove only the muffler, backplate, and cylinder head. Flush the entire engine with fresh fuel and reassemble. Apply after-run oil to the engine and store or re-install the model. Do not disassemble your engine further than described above, or your warranty may be voided. Thunder Tiger has provided you a special tool for normal maintenance. You can use this tool provided in the box to dismantle the cylinder head and/or the backplate. The 2 plugs on the tool should be matched with the 2 slots on the parts, then twist the tool counterclockwise to loosen the parts (clockwise).

